

RIVER STAGES AND FLOODS FOR JUNE AND JULY 1947

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Precipitation during July was below normal except in Pennsylvania, New York, New England, Florida, California, Oregon, and Washington. The average precipitation for Iowa for July, as determined from preliminary reports, was 49 percent of normal, as compared to 220 percent for the month of June. Several States from the Mississippi Valley westward had less than 50 percent of their normal precipitation for July. Nevada received only 10 percent of the normal rainfall for that State.

The severe June floods in the lower Missouri and middle Mississippi Rivers continued into July. A crest of 40.3 feet was recorded at St. Louis, Mo., on July 2, the highest stage at St. Louis since 1844. During July destructive flash floods were reported on small ungaged streams in Indiana, Ohio, New York, New England, Pennsylvania, and Virginia. Droughts were reported in the Southwest, particularly in Arizona, Arkansas, New Mexico, and Texas.

JUNE-JULY FLOOD IN THE MIDWEST

During the early morning hours of July 2, 1947, the crest of the most disastrous flood of record passed St. Louis, Mo., with the stage of the Mississippi River at 40.3 feet. This stage at St. Louis has been exceeded only by the great flood of 1844. The crest at St. Louis followed a month of serious floods in the lower Missouri and middle Mississippi River Valleys. Record stages were reached on many streams, including the Des Moines, Raccoon, Platte, and Grand Rivers in Missouri, and at a few stations on the Mississippi and Missouri Rivers. Several crests were reported on many streams during June. Preliminary estimates indicated that damage caused by the floods to crops, roads, bridges, and private property exceeded 100 million dollars. Several lives were lost, and millions of tons of valuable soil were lost from Missouri, Iowa, Kansas, and Nebraska in the form of erosion. The exact loss resulting from the floods will be difficult to evaluate.

A prolonged period of recurring heavy rainfall maintained severe floods in most of the streams of Iowa, Nebraska, northern Kansas, and Missouri during June. Precipitation over most of this area averaged from 2 to 4 times the usual amount received during June. A few stations in Iowa and Missouri reported monthly totals exceeding 20 inches. Lathrop, Mo., had 23.60 inches during June.

Upper Mississippi Basin.—Severe overflow occurred on the Mississippi River from Keokuk, Iowa, to the mouth of the Ohio River. The following report of the flood in the Burlington, Iowa, district was received from Mr. C. O. Tucker, Weather Bureau Office, Burlington, Iowa:

Moderate to heavy rains over most of Iowa and adjacent portions of Illinois and Missouri during the latter part of May and throughout the greater part of June 1947, produced severe flooding on the Mississippi River and tributaries in this district.

Peak stages were reached twice during the month on the main stem from Keokuk to near Dam 24. Both times all previous high-water records were equalled or exceeded at Gregory Landing, Hannibal, and Louisiana, Mo.; and Quincy, Ill.

A general rising trend set in on the Mississippi on May 28 and continued, with peak stages being reached between June 8 and 10. A falling trend began on the 11th and continued through June 15. Another rise started in the upper reaches of the district on June 16, extending to the lower reaches by June 17. This rise produced second peak stages on June 20 and 21.

The first station to go above flood stage was Louisiana, Mo., on May 26, and it was also the last station to go below bankful on July 14.

This Mississippi flood was the most damaging of record in this district. Stages from Keokuk, Iowa, to Dam No. 24 were above flood continuously from the latter part of May until the second week in July, and during the month of June averaged 6.3 feet above flood stage.

Flood stages were reached twice during the month of June on the Salt and lower Des Moines Rivers while the Fox and Skunk Rivers were above bankful three times during the month. Flooding on the Des Moines River was quite severe. Crests of 25.1 feet were reached at Keosauqua, Iowa, on June 8 and 16. These were the highest stages since the record crest of 27.9 feet on June 1, 1903.

Two or more crests approaching or exceeding previous high stages were reached on the Cedar, Iowa, Skunk, Raccoon, and Des Moines Rivers. At Des Moines, Iowa, the crest was about 1 foot below the highwater of 1903; but at Boone, Iowa, the 1903 flood was exceeded slightly.

The Mississippi River crested at St. Louis, Mo., at 40.26 feet on July 2. This flood exceeded at St. Louis those of 1943 and 1944 by more than a foot and was exceeded only by the flood of 1844, which reached 41.39 feet. It is interesting to note that although the 1947 stage at St. Louis was higher than in 1943 and 1944, the peak discharge was less. At other points between Alton, Ill., and Thebes, Ill., the U. S. Geological Survey reported that discharges were more nearly in order of the crest stages.

The Ohio River remained at moderate stages throughout the flood period, and the flood in the Mississippi flattened off rapidly below the mouth of the Ohio.

Missouri Basin.—Flood stages were reached on the Missouri River from Blair, Nebr., to its confluence with the Mississippi. Flooding was severe in the Nebraska City-St. Joseph area and from Booneville, Mo., downstream. Serious overflow also occurred in many of the tributaries in Nebraska, northern Kansas, and Missouri. Thirteen lives were lost at Cambridge, Nebr., as a result of a flash flood on Medicine Creek.

Serious overflow occurred along the Republican River from Cambridge to its mouth, where crest stages closely approached those of the 1915 flood, the greatest of record up to that time, but were well below those of the 1935 flood, the greatest of record along the Republican River. The following report of the Cambridge, Nebr., disaster was received from Mr. S. D. Flora, Weather Bureau Office, Topeka, Kans.:

The disaster occurred on the early morning of Sunday, June 22. It was caused by very heavy rains in the basin of Medicine Creek, which empties into the Republican River at Cambridge. The U. S. Geological Survey gage on Medicine Creek at that point registered a crest of 21.0 feet. While the crest of the great 1935 flood is not known definitely at this point, newspaper accounts state that this flood exceeded that of 1935 at Cambridge by 6 to 8 inches.

The flood arrived suddenly and without warning at about 5 a. m., on the morning of June 22 and was reported to have been a "wall of water" nearly 8 feet high. It reached its crest within 2 hours from the time it was first felt.

Many residents were caught in their houses and in some instances it was necessary to cut holes in roofs in order to escape. Thirteen persons were reported killed. Preliminary reports of the Red Cross showed 30 homes and 10 trailer houses completely destroyed; 40 houses received major damage and 30, minor damage; 65 other buildings were destroyed and 70 damaged. A total of 250 homes was affected. Also, according to the same source, 196 persons were safely rescued and 175 persons received first aid or medical treatment.

Three fourths of the town was covered with water. Miles of railway track in the vicinity were washed out. In the flooded section, mud up to two feet deep covered streets after the water receded.

Property damage in the town was estimated at a million dollars and it was estimated that it would cost \$40,000 and require at least 40 days to clean up the debris and silt.

Severe overflow also occurred along the Big and Little Blue Rivers, but the stages reached were generally not record-breaking. At Beatrice, Nebr., a crest of 27.65 feet on the 23d was the highest of record, with the possible exception of 1903. Light to moderate overflow occurred in sections of the Kansas River and the Solomon and Osage Rivers.

The Platte River at Agency, Mo., exceeded the previous

highest stage of record at that station by more than 5 feet. The Grand River in Missouri experienced several crests during the month, two of which exceeded previous maximum stages.

The main stem of the Missouri exceeded flood stage at and below Blair, Nebr. A new all-time record high was set at Nebraska City, Nebr., with a crest of 20.1 feet, reached July 1 and 2, exceeding the previous record of 19.9 feet set in 1943. A near-record stage was reached at Lexington, Mo., but the flood was only moderate at Kansas City. Below Kansas City flooding was severe. Previous maximum stages of record were exceeded at Waverly and Boonville, Mo., and near-record stages were reached at Hermann and St. Charles, Mo.

FLOOD STAGE REPORT FOR JUNE AND JULY 1947

[Table includes flood data for months of June and July, since June data were incomplete at the time that the June issue of the Review was published. All dates are June unless otherwise specified]

FLOOD STAGE REPORT FOR JUNE AND JULY 1947—Continued

River and station	Flood stage	Above flood stages— dates		Crest 1	
		From—	To—	Stage	Date
ST. LAWRENCE DRAINAGE Lake Erie					
St. Marys: Decatur, Ind.	13	1	5	18.2	3
St. Joseph: Montpeller, Ohio	10	3	4	10.4	3
Maumee: Fort Wayne, Ind.	15	3	5	17.0	4
Sandusky:					
Upper Sandusky, Ohio	13	3	3	14.5	3
Tiffin, Ohio	7	8	8	15.6	8
				7.1	8
ATLANTIC SLOPE DRAINAGE					
Connecticut:					
South Newbury, Vt.	22	3	6	28.0	4
White River Junction, Vt.	18	3	6	23.0	4
Lehigh: Lehigh, Pa.	9	8	17	11.2	8
Chenango: Sherburne, N. Y.	8	3	3	9.2	17
Chemung:				8.7	3
Elmira, N. Y.	12	3	4	12.8	3
Chemung, N. Y.	12	3	4	16.1	3
James: Columbia, Va.	10	15	15	11.0	15
Saluda: Pelzer, S. C.	6	14	16	7.5	15
Broad:					
Gaffney, S. C.	10	15	15	11.0	15
Blairs, S. C.	14	16	16	15.5	16
Catawba: Catawba, N. C.	8	14	16	18.2	14
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	May 25	4	16.4	1
Choctawhatchee: Caryville, Fla.	12	25	29	16.0	27
		1	2	12.0	1-2
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Whitewater: Beaver, Minn.	7	July 27	July 27	8.6	July 27
Rock: Moline, Ill.	10	2	9	10.8	4-5
Cedar:					
Waterloo, Iowa	12	13	16	18.7	13-14
		3	3	13.1	3
Cedar Rapids, Iowa	13	5	6	13.3	6
		14	17	18.3	15-16
				16.5	9
Iowa: Wapello, Iowa	10	4	July 5	16.9	17
				12.0	25
				19.5	9
				18.4	14
Skunk: Augusta, Iowa	15	18	26	18.9	20
		30	3	18.9	July 2
Boone: Webster City, Iowa	10	22	26	12.5	25
		2	7	19.3	5
		12	18	21.8	12
Raccoon: Van Meter, Iowa	13	19	19	13.0	19
		22	29	16.0	23
				21.4	25
Des Moines:					
Des Moines, Iowa	23	25	28	26.5	26
		May 29	May 31	16.8	May 30
		2	10	25.8	6
Tracy, Iowa	14			26.4	14
		13	July 9	20.7	23
				20.2	25
				21.5	27
				18.4	May 31
Eddyville, Iowa	15	May 26	July 9	27.8	7
				28.1	15
				22.3	23-24
				23.1	28
		May 29	12	11.4	May 31
Ottumwa, Iowa	9			20.4	7
		13	July 9	20.0	15
				16.2	24
				16.6	28
Keosauqua, Iowa	20	7	9	25.1	8
		15	17	25.1	16
Meramec:					
Pacific, Mo.	11	July 1	July 3	13.0	July 3
Valley Park, Mo.	14	27	July 8	15.3	28
				20.3	July 2
Mississippi:					
Gordon's Ferry, Iowa	13	13	17	14.2	14
Muscatine, Iowa	15	16	21	16.1	18
				16.0	20
Kelthsburg, Ill.	12	5	12	13.2	10
		16	26	15.3	20
Burlington, Iowa	15	8	11	15.5	9
		18	24	17.1	20
				20.2	8
				20.0	8
Keokuk, Iowa	12	1	July 10	19.0	17
				20.2	20
				16.4	29
				17.3	July 1
				15.3	2
Quincy, Ill.	14	May 30	July 11	23.9	10
				23.5	20
				20.2	July 2
				16.1	2
Hannibal, Mo.	13	May 27	July 18	24.1	9
				23.8	21
				20.5	July 2
				15.0	2-3
Louisiana, Mo.	12	May 23	July 14	21.9	9
				22.3	21
				18.7	July 3
Grafton, Ill.	18	5	July 14	26.6	13, 14
				27.5	26
St. Louis, Mo.	30	9	July 13	36.6	14
				39.3	30
				40.26	July 2
				34.8	16-17
Chester, Ill.	27	7	July 15	36.5	28
				87.9	July 1
				38.17	July 4
				38.6	17
Cape Girardeau, Mo.	32	8	July 16	40.4	July 1
				41.9	July 5-6
Missouri Basin					
Elkhorn:					
Neligh, Nebr.	10	23	26	12.8	23
Norfolk, Nebr.	10	25	26	11.0	26
Pilger, Nebr.	12	27	28	12.2	27
West Point, Nebr.	12	28	30	12.6	29
Platte:					
Overton, Nebr.	7	Gage destroyed			
Ashland, Nebr.	7	25	25	7.3	25
		6	10	26.5	9
Solomon: Beloit, Kans.	18	12	15	24.2	14
		23	29	24.8	24
				16.5	13
Little Blue: Hanover, Kans.	14	12	14	16.4	14
		22	25	20.2	24
Big Blue:					
Beatrice, Nebr.	16	12	13	17.7	13
		15	16	16.8	16
		22	26	27.6	23
		6	7	21.9	6
		12	14	27.0	13
Barnston, Nebr.	18	16	17	19.3	16
		18	19	19.8	19
		21	21	19.3	21
		22	27	29.8	23
		6	7	24.6	6
Blue Rapids, Kans.	20	12	16	27.7	14
		20	21	21.8	21
		22	27	33.2	24
		7	7	22.9	7
Randolph, Kans.	22	14	15	23.8	14
		21	21	24.1	21
		24	26	27.0	25
Republican:					
Bloomington, Nebr.	8	22	24	15.1	23
Guide Rock, Nebr.	10	22	26	18.8	23
Hardy, Nebr.	11	22	26	17.0	24
Scandia, Kans.	10	22	27	15.0	24
		22	23	8.8	22-23
Concordia, Kans.	8	24	26	12.9	25
		7	7	16.1	7
Clay Center, Kans.	15	13	13	16.4	13
		22	29	18.6	23
				22.9	26
See footnote at end of table.					

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FLOOD STAGE REPORT FOR JUNE AND JULY 1947—
Continued

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
<i>Missouri Basin—Continued</i>					
<i>Feet</i>				<i>Feet</i>	
Republican—Continued					
Wakefield, Kans.....	11	{ 23	24	11.2	23
Junction City, Kans.....	10	{ 25	28	15.5	26
Kansas:		{ 26	28	15.8	27
Ogden, Kans.....	18	{ 27	28	20.5	27
		{ 7	8	18.1	7
Manhattan, Kans.....	17	{ 14	15	18.1	14
		{ 24	29	20.7	26
		{ 24	29	22.4	27
Wamego, Kans.....	16	{ 25	28	18.1	26
		{ 25	28	17.4	28
Topeka, Kans.....	21	{ 26	27	21.9	27
Lecompton, Kans.....	17	{ 28	28	21.2	28
Lawrence, Kans.....	18	{ 26	28	17.6	27
		{ 27	27	18.1	27
Thompson Fork: Trenton, Mo.....	20	{ 5	7	25.4	6
Grand:		{ 22	24	21.5	23
Gallatin, Mo.....	20	{ 6	9	33.3	8
		{ 13	15	24.2	14
		{ 19	26	34.5	24
		{ 1	11	25.5	2
		{ 1	11	33.8	7
Chillicothe, Mo.....	18	{ 12	18	29.4	15
		{ 18	28	33.4	24
		{ 29	July 2	24.0	July 1
		{ 29	July 13	16.9	5
Brunswick, Mo.....	12	{ May 29	July 13	23.8	9
		{ July 15	July 16	24.5	26
		{ July 15	July 16	13.5	July 16
Osage:					
Quenemo, Kans.....	27	{ 7	8	32.0	8
Ottawa, Kans.....	24	{ 7	9	26.0	9
Osawatomie, Kans.....	28	{ 7	10	34.1	9
		{ 23	24	30.7	24
LaCygne, Kans.....	25	{ 7	11	29.0	11
		{ 23	26	28.5	24
Trading Post, Kans.....	24	{ 8	12	25.9	12
		{ 24	27	25.5	27
Lakeside (Bagnell Dam), Mo.....	60	{ 28	July 3	60.3	July 1
		{ July 7	July 7	60.1	July 7
Big Sioux: Akron, Iowa.....	12	{ 13	18	16.5	18
		{ 25	26	12.8	26
Floyd: James, Iowa.....	14	{ 23	26	17.8	26
Missouri:					
Blair, Nebr.....	19	{ 28	July 3	20.0	June 30
		{ 28	July 3	19.1	July 2
Omaha, Nebr.....	19	{ July 1	July 2	17.1	July 2
		{ 4	5	18.7	5
		{ 12	20	19.3	20
Nebraska City, Nebr.....	15	{ 22	July 8	19.4	26, 27, 28
		{ 22	July 8	20.1	July 8
St. Joseph, Mo.....	17	{ 6	7	17.5	7
		{ 13	July —	20.4	13
Kansas City, Mo.....	22	{ 15	July 5	27.0	22
Lexington, Mo.....	22	{ 6	July —	28.2	22
		{ 4	6	18.3	6
Waverly, Mo.....	18	{ 6	July 12	22.5	12
		{ 6	July 12	25.1	12
Booneville, Mo.....	21	{ 4	July 13	29.4	13
		{ 4	July 13	32.0	13
Jefferson City, Mo.....	23	{ 7	July 13	22.9	13
		{ 7	July 13	28.2	13
		{ 7	July 13	32.6	13
Hermann, Mo.....	21	{ 5	July 13	22.3	13
		{ 5	July 13	27.1	13
St. Charles, Mo.....	25	{ 5	July 14	30.9	14
		{ 5	July 14	32.4	14
		{ 5	July 14	35.3	14
<i>Ohio Basin</i>					
Allegheny: Punxsutawny, Pa.....	7	{ 18	18	8.9	18
Middle: Midvale, W. Va.....	11	{ 8	8	12.3	8
Tygart: Philippi, W. Va.....	17	{ 8	9	17.6	9
		{ 2	3	12.2	3
Olentangy: Delaware, Ohio.....	9	{ 8	8	11.0	8
Scioto:					
LaRue, Ohio.....	11	{ 2	4	13.8	4
Prospect, Ohio.....	10	{ 2	5	13.0	5
		{ 3	6	20.0	6
Circleville, Ohio.....	14	{ 15	16	15.0	16
Chillicothe, Ohio.....	16	{ 4	6	20.7	6
Piketon, Ohio.....	15	{ 4	7	20.8	7
Miami: Middletown, Ohio.....	15	{ 2	4	16.8	4
West Fork:					
Edwardsport, Ind.....	12	{ May 30	16	20.9	16
		{ May 30	16	19.4	16
Anderson, Ind.....	10	{ 2	4	11.1	4
Elliston, Ind.....	18	{ 2	12	24.0	12
		{ 2	12	22.5	12
East Fork:					
Seymour, Ind.....	14	{ 2	6	17.9	6
		{ 9	9	14.4	9
Williams, Ind.....	10	{ 6	10	13.8	10
White:					
Petersburg, Ind.....	16	{ 2	16	21.9	8—
Hazleton, Ind.....	16	{ 2	17	22.9	10—

See footnote at end of table.

FLOOD STAGE REPORT FOR JUNE AND JULY 1947—
Continued

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
Ohio Basin—Continued					
Wabash:	<i>Feet</i>			<i>Feet</i>	
Wabash, Ind.	12	{ 2	5	19.6	3
		7	10	17.8	8
Lafayette, Ind.	11	2	11	18.4	4
				17.2	9
Covington, Ind.	16	3	13	21.4	6
				21.0	10
Terre Haute, Ind.	14	5	15	18.9	9
Mt. Carmel, Ill.	17	5	18	21.6	9
Vincennes, Ind.	16	11	18	19.0	14
New Harmony, Ind.	15	9	18	17.0	14
Tennessee: Kentucky Dam, Ky. (Lower Gage) }	27	{ May 26	2	29.7	May 26
		15	22	29.1	18
Ohio:					
Dam No. 50, Fords Ferry, Ky.	34	May 27	May 31	35.3	May 29
		April 12	May 8	44.4	May 1
Dam No. 53, near Mound City, Ill.	42	15	22	44.0	18
		July 5	July 6	42.1	July 6
		8	10	40.0	8, 9, 10
Cairo, Ill.	40	{ 11	July 13	45.3	19
				43.9	July 6
White Basin					
Black:					
Leeper, Mo.	11	28	28	12.2	28
Poplar Bluff, Mo.	16	29	30	16.3	29
White: Clarendon, Ark.	26	May 29	3	26.0	May 29-31
Arkansas Basin					
Neosho:					
Emporia, Kans.	23	7	7	24.6	7
Burlington, Kans.	27	7	7	27.9	7
LeRoy, Kans.	23	8	8	23.4	8
Iola, Kans.	15	8	9	16.0	8
Deep Fork: Dewar, Okla.	18	2	3	18.7	2
North Canadian:					
Woodward, Okla.	5	27	27	5.5	27
Canton, Okla.	9	28	28	9.8	28
Canadian: Whitefield, Okla.	16	1	2	16.95	1
Fouche La Fave: Perryville, Ark.	20	{ May 17	May 31	25.0	May 22
		5	5	20.2	5
Arkansas:					
Great Bend, Kans.	8	6	6	8.8	6
Hutchinson, Kans.	6	7	7	6.3	7
Ft. Smith, Ark.	22	2	2	22.3	2
Van Buren, Ark.	22	2	3	23.5	3
Red Basin					
Sulphur: McCartney Bridge, Tex.	22	May 23	1	24.7	May 26
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.	20	30	July 6	21.6	July 3
St. Francis, Ark.	18	July 5	July 11	18.9	July 8
Mississippi:					
New Madrid, Mo.	34	{ 16	24	35.6	20
		July 5	July 9	34.5	July 7
Caruthersville, Mo.	32	{ 17	25	33.8	20-21
		July 6	July 10	32.6	July 8
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La.	25	April 19	July 9	26.5	May 2-12
				25.6	11-15
WEST GULF OF MEXICO DRAINAGE					
Nesque Bayou: Basile (near), La.	22	23	27	23.6	25
Calcasieu: Kinder, La.	16	22	23	18.97	22
Sabine: Mineola, Tex.	14	26	30	15.5	28
East Fork: Rockwall (near), Tex.	10	21	27	12.1	22
Trinity:					
Dallas, Tex.	28	20	23	36.6	22
Rosser, Tex.	26	22	27	29.1	25
Trinidad, Tex.	28	24	30	31.2	28
Nueces: Cotulla, Tex.	15	27	28	16.4	27
GULF OF CALIFORNIA DRAINAGE					
Colorado Basin					
Eagle: Eagle, Colo.	5	{ 9	9	5.0	9
		21	21	5.1	21
Gunnison: Delta, Colo.	9	{ May 3	May 13	10.4	May 7
		8	13	9.9	10
		20	24	10.1	22
Animas: Durango, Colo.	4			5.3	9
Colorado: Grand Junction, Colo.	11	22	22	11.2	22
Columbia Basin					
Willamette: Portland, Oreg.	18	11	15	18.7	13
Columbia:				43.4	May 12
				42.5	May 28
The Dalles, Oreg.	40	May 9	23	42.1	4
				42.4	9
				43.1	11, 13
				42.5	19
				18.7	May 13
				18.0	May 18
Vancouver, Wash.	15	May 10	25	17.5	May 31
				17.4	6
				19.1	13
				17.9	20

¹ Provisional.